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Related Articles

The ARO4 gene of Candida albicans encodes a tyrosine-sensitive DAHP synthase: evolution, functional conservation and phenoty Aro3p-, Aro4p-deficient mutants.

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The enzyme 3-deoxy-D-arabinoheptulosonate-7-phosphate (DAHP) synthase catalyses the first step in aromatic amino acid biosynthesis in prokaryotes, plant fungi. Cells of Saccharomyces cerevisiae contain two catalytically redundant D synthases, encoded by the genes ARO3 and ARO4, whose activities are feedback-inhibited by phenylalanine and tyrosine, respectively. ARO3/4 gene transcription is controlled by GCN4. The authors previously cloned an ARO3 g orthologue from Candida albicans and found that: (1) it can complement an aro double mutation in S. cerevisiae, an effect inhibited by excess phenylalanine, ar homozygous aro3-deletion mutant of C. albicans is phenotypically Aro(+), sugg the existence of another isozyme(s). They now report the identification and fun characterization of the C. albicans orthologue of S. cerevisiae Aro4p. The two A enzymes share 68% amino acid identity. Phylogenetic analysis places the funga DAHP synthases in a cluster separate from prokaryotic orthologues and suggest ARO3 and ARO4 arose from a single gene via a gene duplication event early in fungal evolution. C. albicans ARO4 mRNA is elevated upon amino acid starvat consistent with the presence of three putative Gcn4p-responsive elements (GCR the gene promoter sequence. C. albicans ARO4 complements an aro3 aro4 dout mutation in S. cerevisiae, an effect inhibited by excess tyrosine. The authors engineered Deltaaro3/Deltaaro3 Deltaaro4/MET3p::ARO4 cells of C. albicans (one wild-type copy of ARO4 placed under control of the repressible MET3 pro and found that they fail to grow in the absence of aromatic amino acids when A expression is repressed, and that this growth defect can be partially rescued by aromatic amino acids and certain aromatic amino acid pathway intermediates. It concluded that, like S. cerevisiae, C. albicans contains two DAHP synthases rec for the first step in the aromatic amino acid biosynthetic pathway.